

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 to 13 (canceled).

Claim 14 (currently amended): A method for designing a nuclear fuel assembly which is intended to be positioned in a nuclear reactor, the assembly comprising a plurality of guide tubes and a control cluster which comprises a plurality of control rods and a support for the control rods, the control rods and the guide tubes extending in parallel with a longitudinal direction, each of the control rods being received in a guide tube in order to form pairs comprising guide tubes/ control rods, each of the guide tubes comprising a lower damping portion which comprises at least a section of reduced inside diameter, the lower damping portion configured to contain a fluid for damping a fall of the control rod which is received in the guide tube, the section of reduced inside diameter surrounding the control rod with a radial passage gap when the control rod is introduced in the guide tube, the method comprising:

- calculating an expected falling speed of the control rods upon entry into the lower damping portions when the control cluster falls in an event of a shutdown of the nuclear reactor;

- calculating, based on the falling speed, a progression of the falling speed of the control rods in the lower damping portions;

- calculating, based on the progression of the falling speed of the control rods in the lower damping portions, a maximum elevated pressure produced in the fluid contained in the lower damping portions;

- calculating, based on the maximum elevated pressure, a maximum circumferential stress produced in the lower damping portions; and

designing the guide tubes as a function of the maximum circumferential stress so that a maximum stress admissible by the guide tube is not exceeded.

Claim 15 (currently amended): A method for designing a nuclear fuel assembly which is intended to be positioned in a nuclear reactor, the assembly comprising a plurality of guide tubes and a control cluster which comprises a plurality of control rods and a support for the control rods, the control rods and the guide tubes extending in parallel with a longitudinal direction, each of the control rods being received in a guide tube in order to form pairs comprising guide tubes/ control rods, each of the guide tubes comprising a lower damping portion which comprises at least a section of reduced inside diameter, the lower damping portion configured to contain a fluid for damping a fall of the control rod which is received in the guide tube, the section of reduced inside diameter surrounding the control rod with a radial passage gap when the control rod is introduced in the guide tube, the method comprising:

calculating an expected falling speed of the control rods upon entry into the lower damping portions when the control cluster falls in an event of a shutdown of the nuclear reactor;

calculating, based on the falling speed, a progression of the falling speed of the control rods in the lower damping portions;

calculating, based on the progression of the falling speed of the control rods in the lower damping portions, a maximum elevated pressure produced in the fluid contained in the lower damping portions;

calculating, based on the maximum elevated pressure, a maximum circumferential stress produced in the lower damping portions; and

designing the guide tubes as a function of the maximum circumferential stress; and

~~The method according to claim 14, further comprising:~~

verifying, using the maximum circumferential stress, that a maximum stress admissible by the guide tube has not been exceeded.

Claim 16 (previously presented): The method according to claim 14, wherein the

calculating, based on the falling speed, a progression of the falling speed of the control rod in the lower damping portion, is preformed using a higher value for the radial passage gap and the step of calculating, based on the progression of the falling speed of the control rod in the lower damping portion, a maximum elevated pressure produced in the fluid contained in the lower damping portion, is performed using a lower value for the radial passage gap.

Claim 17 (previously presented): The method according to claim 16, wherein the higher value is the maximum statistical value for the passage gap.

Claim 18 (previously presented): The method according to claim 16, wherein the lower value is the minimum statistical value for the passage gap.

Claims 19 to 26 (canceled).

Claim 27 (new): The method according to claim 15, wherein the calculating, based on the falling speed, of a progression of the falling speed of the control rod in the lower damping portion, is performed using a higher value for the radial passage gap and the step of calculating, based on the progression of the falling speed of the control rod in the lower damping portion, a maximum elevated pressure produced in the fluid contained in the lower damping portion, is performed using a lower value for the radial passage gap.

Claim 28 (new): The method according to claim 27, wherein the higher value is the maximum statistical value for the passage gap.

Claim 29 (new): The method according to claim 27, wherein the lower value is the minimum statistical value for the passage gap.